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A new species of bopyrid isopod, *Pseudione chiloensis,* a parasite of *Nauticaris magellanica* (A. Milne-Edwards, 1891) (Crustacea: Decapoda: Hippolytidae)

Ramiro Román-Contreras and Ingo Wehrtmann

Instituto de Ciencias del Mar y Limnología,
Universidad Nacional Autónoma de México (UNAM), P.O. Box 70-305,
Mexico, D.F. 04510 (IW) Alfred Wegener Institut. Am Handelshafen 12,
27560 Bremerhaven, Germany

Abstract.—*Pseudione chiloensis* sp. nov., is described from the central-southern Chilean region, parasitic on the hippolytid shrimp *Nauticaris magellanica* (A. Milne-Edwards, 1891). Females of *Pseudione chiloensis* are similar to *Pseudione affinis* (Sars, 1882), *Pseudione indica* Chopra, 1930 and *Pseudione parviramus* Adkison, 1988 in having a wide frontal lamina, first antennae 3-segmented, 5 pairs of biramous pleopods, uropods uniramous, and eyes present; *Pseudione chiloensis* differ from these species in the absence of ornamentations on internal crest of oostegite 1, female's size, and setose maxillipedal palp. Males of *Pseudione chiloensis* are similar to those of *Pseudione affinis, Pseudione indica,* and *Pseudione parviramus* in having eyes present, first antennae 3-segmented, pleon of six pleomeres, midventral tubercules present on pereomeres, 5 pairs of uniramous pleopods, and last pleomere bifurcated; but differ from these species in having the second antennae 6-segmented, (7-segmented in the former species). Although males and females of *Pseudione chiloensis* share some characters with these species, the morphological differences and host lead us to propose a new species.

Resúmen.—*Pseudione chiloensis* n. sp., es descrita de la región centro-sur de la costa chilena, parásito del hipolítido *Nauticaris magellanica* (A. Milne-Edwards, 1891). Las hembras de *Pseudione chiloensis* son similares a *Pseudione affinis* (Sars, 1882), *Pseudione indica* Chopra, 1930 y *Pseudione parviramus* Adkison, 1988 en que tiene la primera antena 3-segmentada, 5 pares de pleópodos birrámeos, urópodos unirrámeos y ojos presentes. *Pseudione chiloensis* difiere de esas especies en la ausencia de ornamentaciones en la cresta interna del oostegito 1. *Pseudione magna* Shiino, 1951 difiere de *Pseudione chiloensis, Pseudione affinis, Pseudione indica,* y *Pseudione parviramus* en que tiene la segunda antena 4-segmentada, lámina frontal angosta y ausencia de ojos. Los machos de *Pseudione chiloensis* son similares a los de *Pseudione affinis, Pseudione indica* y *Pseudione parviramus* en la presencia de ojos, primera antena 3-segmentada, pleón de seis pleómeros, tubérculos medio-ventrales en los pereómeros, 5 pares de pleópodos unirrámeos y el último pleómero bifurcado. Los machos de *Pseudione chiloensis* difieren de *Pseudione magna* en la primera y segunda antenas que son 2- y 4-segmentadas, respectivamente, en la última especie; en *Pseudione parviramus* las segundas antenas son 7-segmentadas, y 6-segmentadas en *Pseudione chiloensis.* Aunque esta especie comparte características con las especies mencionadas, al mismo tiempo presenta caracteres y hospedero particulares para ser propuesta como una especie nueva.

Three species of the genus *Pseudione* have been described from the Chilean waters: *Pseudione tuberculata* Richardson, 1904 parasitizing *Neolithodes diomedae* (Benedict); *Pseudione paucisecta* Richardson, 1904 parasitic on *Munida curvipes* Benedict, and *Pseudione battstroemi* Stuardo, Vega, & Céspedes, 1986 parasitic on *Callianassa uncinata* H. Milne-Edwards. We report a new species of *Pseudione* parasitizing *Nauticaris magellanica* (A. Milne-Edwards, 1891), an hippolytid shrimp from the South American coasts including the Falkland Islands (Boschi 1979).

In Chile *Nauticaris magellanica* is one of the most abundant shrimps associated with mussel raft cultures (Aracena & López 1973, Wehrtmann & Albornoz 1997), and has been collected from holdfasts of the kelp *Macrocystis pyrifera* from the southern region (Ojeda & Santelices 1984). However, despite intensive sampling efforts over the past 4 years along the entire coast of Chile, only eleven parasitized individuals of *N. magellanica* were obtained exclusively from Putemún, Chiloé, central southern Chile.

Nauticaris marionis Bate, has been recorded in New Zealand (Page 1985) as a host for *Pseudione affinis,* this being the first record of Pseudionidae parasitizing the genus *Nauticaris.* Although our specimens share attributes with other species of *Pseudione,* there are differential characters which justify a new species. Two individuals male and female, were chosen as type specimens and prepared for SEM photographs.

Order Isopoda
Suborder Epicaridea
Family Bopyridae Rafinesque, 1815
Subfamily Pseudioninae R. Codreanu, 1967
Genus *Pseudione* Kossmann, 1881
Pseudione chiloensis, new species
(Figs. 1–15)

Holotype female (dry).—USNM-274301; allotype male (dry): USNM-274302 (both male and female, mounted on a stub for MEB).

Material examined (Paratypes).—USNM-274256 (2 specs.), USNM-274257 (1 spec.); ICMyL-UNAM-4999 (1 spec.), ICMYL-UNAM-5000 (7 specs.).
One adult male and 1 female, 5 Jun 1993; 1 female with cryptoniscus larvae associated, 5 Jun 1993; 2 males and 2 females, 12 May 1994; 1 male and 1 female, 5 Jun 1994; 5 males and 5 females, 13 May 1994; 1 male and 1 female, 26 Jun 1994. Two fully developed individuals male and female, were used for descriptions and selected as type specimens.

Type locality.—Putemún (42°25′S; 73°43′W), Chiloé Island, central-southern Chile.

Host.—Nauticaris magellanica; most infected individuals were males (n = 10; total length varying between 14.93 and 19.15 mm; $\bar{X}$ = 17.96 mm); the only non-ovigerous female infected measured 22.61 mm total length.

Habitat.—The shrimps parasitized were associated with massive cultures of *Mytilus chilensis,* and were collected from approximately 5 m depth (salinity 29.5–29.7 ppm; temperature 9.0–10.5°C).

Description of female (Figs. 1–8).—Length 4.0 mm, width 2.9 mm; head triangular, slightly wider than long, deeply set into first pereomere but discernable (Fig. 2); barbula with two lateral projections on each side; anterolateral borders of head almost rounded, frontal lamina wide, rounded (Figs. 1, 2); maxilliped anterolaterally rounded, falcate, 3–4 setae on upper border, unarticulated palp (Fig. 3). First antenna 3 segmented; basal segment globose; second segment cylindrical, almost as high as former, 5 small aesthetascs on upper border; third segment cylindrical, smooth, 0.75 slender than previous, 5 aesthetascs on tip (Fig. 4). Second antenna 5 segmented, basal segment subovoid, other segments cylindrical, almost as high as the former but slender; fourth and fifth segments smooth, apical segment with a tuft of 5 setae (Fig. 5);

distal segment projects slightly beyond the border of frontal lamina; squamous structures on surface of both antennae; eyes present. Pereon margins forming smooth curve; thin, conspicuous rectangular coxal plates on pereomeres 1–4 conspicuously exceeding border; tergal projections narrow, pigmented on short side. Oostegite 1 covering head and partially anterior portion of brood pouch; anterior lobe rounded, higher than posterior, no ornamentation on internal ridge (Fig. 6). Strong pigmentation on oostegites of short side; some chromatophores dispersed on oostegites 2–4 of opposite side. Oostegites 2–4 foliate, fifth oostegites fringed, slender, extending across posterior region of brood pouch, and overlapping opposite one. First two pereopods smaller than last five, small subcuadrangular carina on basis of first four pairs (Fig. 7); last three pairs of pereopods not carinated. All articles distinct, small scales on ventral surface of legs, four small setae on carpus, dactyli deeply set into propodi. Pleomeres completely separated dorsal and laterally, ending in lateral, foliate, and rounded plates. Five pairs of biramous foliate pleopods, partially covering ventral surface of pleon (Fig. 1); border of pereomeres 5–7 dorsally folded and directed forward on short side (Fig. 8); endopods shorter and narrower than exopods, lanceolate, both rami progresively larger from first to fifth pleopods; uropods uniramous present.

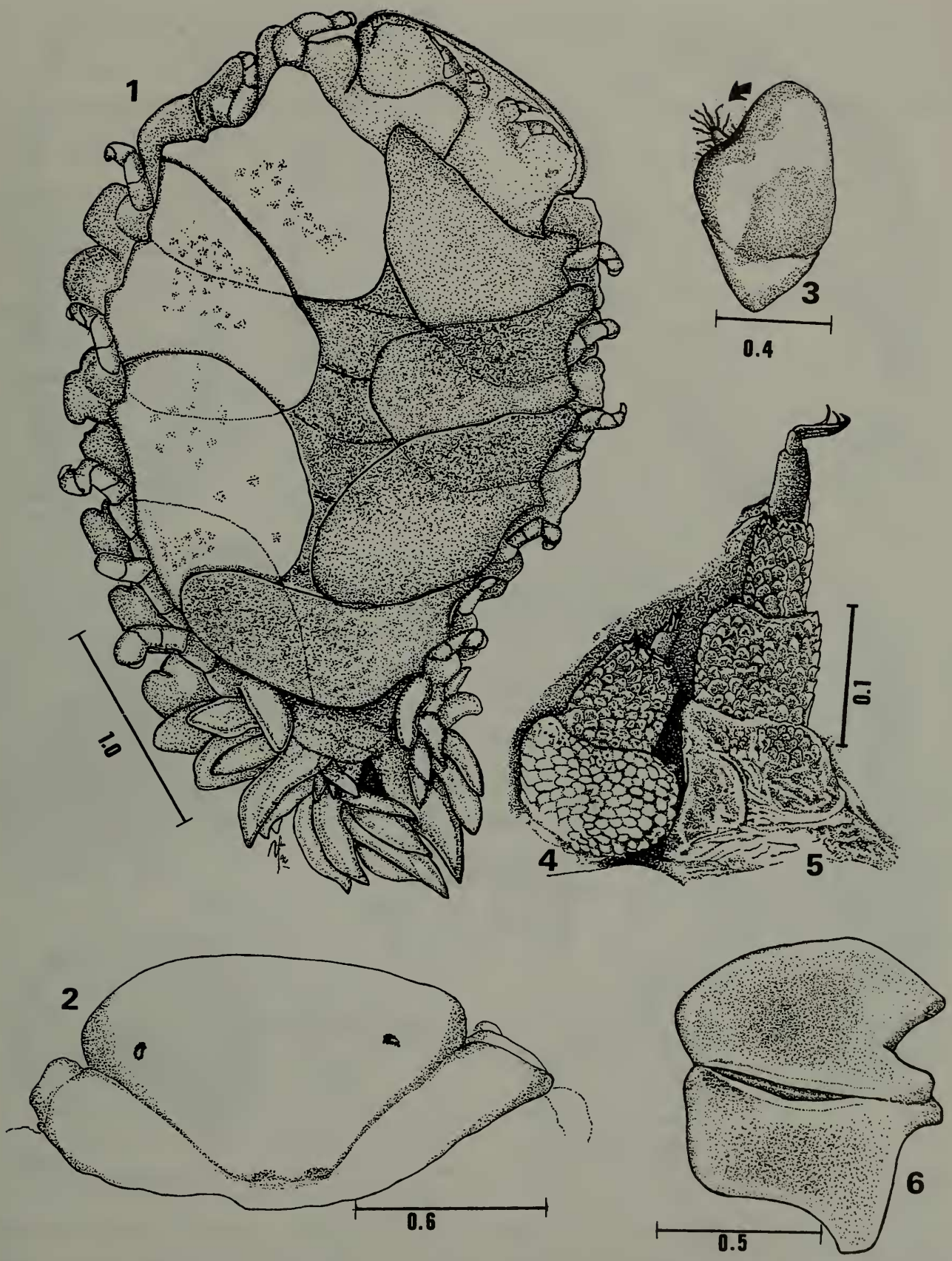
Description of male (Figs. 9–15).—Length 0.96 mm, width 0.26 mm. Head anteriorly rounded, wider than long, partially fused with first pereomere but clearly discernable; anterolateral borders rounded; eyespots irregular, conspicuous (Fig. 9). First antenna three segmented, globose basal segment with 2 small setae on external surface; cylindrical medium-sized, second segment; third segment 0.6 smaller than second, ending in a tuft of 6 aesthetascs, small scales on surface (Fig. 10). Second antenna 6-segmented, almost 3 times larger than first one. Basal segment truncated, subpyramidal; second one higher than first; third and fourth segments cylindrical, smooth, slender than former, some setae on upper border; fifth segment slender and shorter than previous; distal segment with tuft of 5–6 setae (Fig. 11) reaching first pereomere; both antennae with scarce scales on surface. Pereomeres all similar, deeply separated laterally and ventrally, tips rounded and reflexed ventrally, with small scales on borders, mid-ventral tubercules on pereomeres (Fig. 12). All pereopods similar in size, not carinated (Fig. 13); dactyli inserted into propodi (Fig. 14). Five distinct pleomeres separated dorsal, ventral, and laterally; five pairs of sessile tuberculiform pleopods on pleomeres 1–5, prominent and conspicuous in ventral view, anal cone present; sixth pleomere bifurcated, ending in short setae, sparse small scales on the tips (Fig. 15); no uropods.

Etymology.—The specific name is in reference to Chiloé, the type location. Gender masculine.

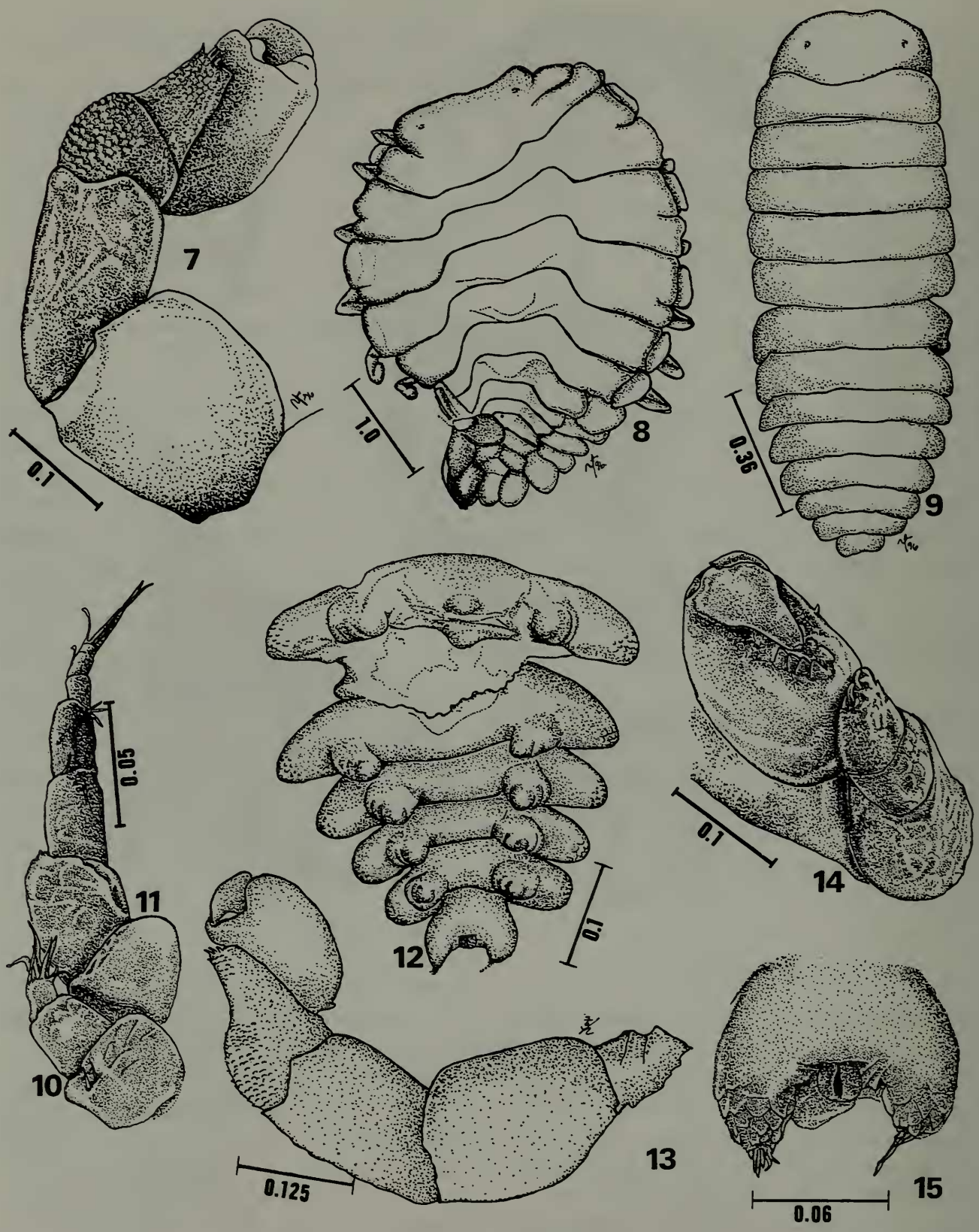
Variations.—Females varied in pigmentation patterns with oostegites 1–5 totally pigmented, and other individuals with oostegites only partially pigmented on the short side; in males the sixth pleomere are bilobed, but others with button-shaped or Y-shaped pleomere.

Discussion

This century many authors have cited the need for a revision for the genus *Pseudione.* The literature shows an immense diversity of forms and the genus parasitizes many families of Anomura and Brachyura, but a few species are known to infect certain genera of Caridea (Chopra 1930). We decided to include our material in the genus *Pseudione* because of the morphological characteristics are in agree with Sars (1899), Bourdon (1968), and Markham's (1985) descriptions; and, although Danforth (1971) quoted that "approximately 60 species of *Pseudione* so far described, identification of a new form is quite difficult", many species of *Pseudione* have since been described



Figs. 1–6. female. *Pseudione chiloensis,* new species. Fig. 1, paratype (ICMYL-UNAM-4999), ventral view. Fig. 2, head of same, dorsal view. Fig. 3, maxilliped with setose palp (arrow). Figs. 4–5, first and second antennae. Fig. 6, first oostegite, internal view (scales in mm).



Figs. 7–15. *Pseudione chiloensis*. Fig. 7, second pereopod (female) Fig. 8, holotype female (dry; USNM-274301), dorsal view. Figs. 9–15 male. Fig. 9, allotype, dorsal view (dry; USNM-274302). Fig. 10–11, first and second antennae. Fig. 12, pleon (broken) in ventral view. Figs. 13–14, seventh leg. Fig. 15, sixth pleomere and anal cone; (scales in mm).

from American waters (Stuardo et al. 1986, Adkison 1988, Adkison & Heard 1995).

Females of *Pseudione chiloensis* are similar to those of *Pseudione affinis, Pseudione indica* Chopra, 1930 and *Pseudione parviramus,* in having a wide frontal lamina, eyes present, first antennae 3-segmented, five pairs of biramous pleopods, and uropods uniramous (Sars 1899, Chopra 1930, Bourdon 1968, Adkison 1988). *Pseudione chiloensis* is similar to *Pseudione magna* Shiino, 1951 in that the first antennae is 3-segmented, pleopods biramous, and uropods uniramous; but the second antennae are 4-segmented, the frontal lamina narrow, and the eyes are absent in the later species. *Pseudione chiloensis* differs from *P. parviramus, P. affinis, P. indica,* and *P. magna* in the absence of ornamentation on internal crest of oostegite 1, and presence of setose maxillipedal palp.

The body size of females is different in the former species as follows: 10.0 and 14.5 mm in *P. affinis* (Sars 1899, Bourdon 1968), 20.2 mm in *P. magna* (Shiino 1951), and 9.0–11.0 mm in *P. parviramus* (Adkison 1988). *Pseudione chiloensis* however, is smaller (4.0 mm) than the former species and more similar in size to *P. indica* (2.0 mm; Shiino 1951).

Males of *P. chiloensis* are similar to those of *P. affinis, P. magna, P. parviramus,* and *P. indica* in having eyes present, pleon six-segmented, and five pairs of tuberculiform pleopods; although the males of *P. magna* differs from *P. chiloensis, P. affinis, P. indica,* and *P. parviramus* in having the first antennae 2-segmented, while these structures are 3-segmented in the remaining species. The second antennae of the males of *P. chiloensis* are 6-articulated, 7-segmented in *P. affinis, P. indica* and *P. parviramus,* and 4-segmented in *P. magna.*

The males of *P. chiloensis* have conspicuous midventral tubercles on pereomeres sixth and seventh, and on the first two pleomeres, and the final pleomere produced into bifurcated and setose structure, similarly to *P. indica* (Markham 1994), but not uropods in Adkison & Heard's sense (Adkison & Heard 1995). In addition, the males of *P. indica* closely resembles that of *Pseudione cognata* Markham, 1985 (Markham 1994).

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